论文

基于变分贝叶斯估计的相机抖动模糊图像的盲复原算法

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Blind Image Deconvolution Algorithm for Camera-shake Deblurring Based on Variational Bayesian Estimation

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摘要 在曝光过程中由于相机抖动而导致的运动模糊，是一种常见的图像降质现象。该文提出了一种基于变分贝叶斯估计和自然图像梯度统计特性的盲复原算法，用于恢复相机抖动模糊图像，同时针对图像复原过程中出现的振铃效应，设计了一种基于分区域检测和Fuzzy滤波器的去振铃效应方法。实验结果表明，该文提出的盲复原算法能够有效地去除图像中因相机抖动而产生的模糊，而且在保持图像边缘和细节的同时，可以较好地降低振铃效应对图像复原质量的影响。

关键词： 图像盲复原   变分贝叶斯   振铃效应   相机抖动

Abstract： Motion blur due to camera shaking during exposure is one common phenomena of image degradation. Based on the variational Bayesian estimation theory and the statistical characteristic of the natural images gradient, a blind image deconvolution algorithm is proposed to restore camera-shake blurred image. In addition, based on sub-region detection and Fuzzy filter, a deringing method is proposed to reduce ringing effect, which is not avoided in the process of image deconvolution. The experimental results show that the algorithm of blind image deconvolution can effectively remove the motion blur caused by camera shaking, and can effectively reduce the ringing effect, while preserve the image edge and details well and improve the quality of the restored image.

Keywords： Blind image deconvolution   Variational Bayesian   Ringing effect   Camera shaking

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